

# Binomial Expansion

## Question Paper 1

<b>Level</b>	A Level
<b>Subject</b>	Maths
<b>Exam Board</b>	OCR - MEI
<b>Module</b>	Core 4
<b>Topic</b>	Algebra
<b>Sub Topic</b>	Binomial Expansion
<b>Booklet</b>	Question Paper 1

**Time Allowed:** 54 minutes

**Score:** /45

**Percentage:** /100

**Grade Boundaries:**

A*	A	B	C	D	E	U
>85%	'77.5%	70%	62.5%	57.5%	45%	<45%

1 (i) Find the first three terms of the binomial expansion of  $\frac{1}{\sqrt[3]{1-2x}}$ . State the set of values of  $x$  for which the expansion is valid. [5]

(ii) Hence find  $a$  and  $b$  such that  $\frac{1-3x}{\sqrt[3]{1-2x}} = 1 + ax + bx^2 + \dots$ . [3]

2 Find the first three terms in the binomial expansion of  $(4+x)^{\frac{3}{2}}$ . State the set of values of  $x$  for which the expansion is valid. [5]

3 (i) Express  $\frac{x}{(1+x)(1-2x)}$  in partial fractions. [3]

(ii) Hence use binomial expansions to show that  $\frac{x}{(1+x)(1-2x)} = ax + bx^2 + \dots$ , where  $a$  and  $b$  are constants to be determined.

State the set of values of  $x$  for which the expansion is valid. [5]

4 Find the first four terms in the binomial expansion of  $\sqrt{1+2x}$ . State the set of values of  $x$  for which the expansion is valid. [5]

- 5 Find the first three terms in the binomial expansion of  $\sqrt[3]{1+3x}$  in ascending powers of  $x$ . State the set of values of  $x$  for which the expansion is valid. [5]

- 6 (i) Given that

$$\frac{3+2x^2}{(1+x)^2(1-4x)} = \frac{A}{1+x} + \frac{B}{(1+x)^2} + \frac{C}{1-4x},$$

where  $A$ ,  $B$  and  $C$  are constants, find  $B$  and  $C$ , and show that  $A = 0$ . [4]

- (ii) Given that  $x$  is sufficiently small, find the first three terms of the binomial expansions of  $(1+x)^{-2}$  and  $(1-4x)^{-1}$ .

Hence find the first three terms of the expansion of  $\frac{3+2x^2}{(1+x)^2(1-4x)}$ . [4]

- 7 Find the first 4 terms in the binomial expansion of  $\sqrt{4+2x}$ . State the range of values of  $x$  for which the expansion is valid. [6]